ON THE OPERATION OF GASTROSTOMY, WITH A REPORT OF A SUCCESSFUL CASE.

By W. B. ROGERS, M. D.,

OF MEMPHIS, TENN.,

PROFESSOR OF PRINCIPLES AND PRACTICE OF SURGERY, AND CLINICAL SURGERY IN THE MEMPHIS HOSPITAL MEDICAL COLLEGE.

THE patient was a male, white, æt. 24, from Craighead Co., Ark., named Arnold Duke, brought to me by his physician, Dr. T. H. Jones, on the 18th of May, 1888. One year *previous* to that date, d, through mistake, swallowed about half an ounce of a solution, to have been of concentrated lye, which produced intense urning in his pharynx and œsophagus, with vomiting of blood. Throat was very sore for some days, with great pain and difficulty in efforts at deglutition. He soon went to work, but it was not long before his health began to fail; constant and increasing difficulty was experienced in swallowing solid food, and on three occasions he was totally nable to swallow either solids or liquids; once during a period of five days, again during a period of eight days, and the last time he had not been able to get down anything for ten days, in consequence of which, he was so much emaciated and weakened that he fainted from sheer exhaustion on entering my infirmary, where I saw him two hours later, somewhat revived, but scarcely able to sit up without the support of my assistant. A brief history of his case having been obtained, I attempted the introduction of a bougie. With this instrument a stricture was detected $7^1/_2$ inches from the incisor teeth. After repeated attempts with various sized instruments, I succeeded in entering the narrowed portion with a No. 6 (American size) urethral gum catheter, with a stylet. Possibly, half an inch, not more, of the catheter entered the narrowed passage. I used pressure very gently, but could pass it no further. The stylet was withdrawn, in the hope that the flexibility of the unsupported catheter would enable it to follow the tortuous canal, but this failed. I then withdrew the catheter, which was tightly grasped by the cicatricial band. A little blood-tinged mucus was spat. Even this slight dilatation afforded some relief, for he found, on trial of water, that he could get a little down into the stomach. Milk was at once substituted, and the night was spent in sipping this food.

The morrow presented us a changed man; the wan, worn and hungered countenance was easy, and even smiled.

The age of this patient, with the history as given, together with the information obtained on my examination, precluded a diagnosis of cancer of the œsophagus, or of intra thoracic tumor. It seemed clearly to be a cicatricial stricture, the result of the cauterizing fluid drank one year before.

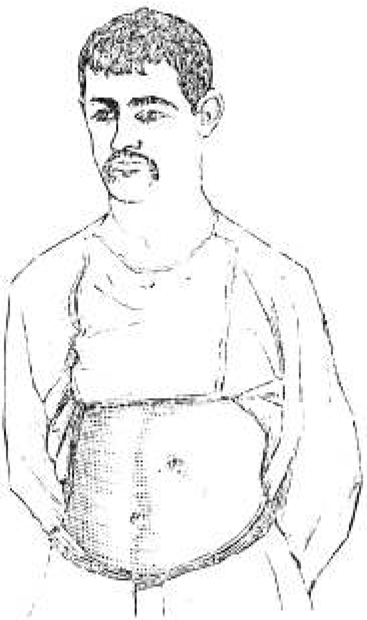

FIG. 1. AN ANTERIOR VIEW OF THE PATIENT, SHOWING THE EXTERNAL OPENING OF THE PERMANENT FISTULA.

On each of six succeeding days, catheterization of the œsophagus was attempted—literally speaking—trying all sizes of urethral instruments, down to No. 2 gum catheter. He was very patient, and the search was faithfully made, but to no purpose. On no occasion did I succeed in finding the opening in the stricture. The point of the instrument would come to an abrupt stop, pointing sometimes to the right, and again to the left side of the contraction. Very little force was used. On three occasions, blood-stained mucus followed the exploration, and each time, much pain was produced, which lasted some hours. Swallowing was rendered more difficult during the remainder of the day, on two occasions. He was enabled all the time to get down about three pints of milk in 24 hours, by devoting himself closely to the business.

I was forced to give up the hope of practicing dilatation, even with its attendant dangers, because of not being able to find the entrance to the narrow portion of the canal, and advised gastrostomy. Repeated examples of life being sustained for months by rectal feeding have been reported, but it seems that in cases of stricture of the œsophagus, that method of sustaining life does not meet with success. As unpalatable as is the idea of a gastric fistula, it was eagerly grasped at by my patient. He was still able to swallow liquids, and even rice and bread, finely crumbled and cooked in milk; but I advised the operation at once, instead of waiting until he became more emaciated, and was caught, as it were, in a spell of starving. He saw the wisdom of it, and consented.

Nourishment by the mouth was continued, and rectal alimentation for the first time in his case, was resorted to. Three times, in each 24 hours, one pint of milk, with beef peptonoids was thrown into his bowel.

At the end of three days, May 29th, 1888, his bowels having been thoroughly emptied by repeated salt-water enemata, and lastly injected with milk, brandy and beef peptonoids, I began the operation of gastrostomy. My assistants were Drs. T. H. Jones, Henning, Williford, Neely, Dorey and S. A. Rogers. Chloroform was the anæsthetic; time of operation, 1 hour and 10 minutes. Morphia, hypodermically, was used half an hour before anæsthetic was begun, and was repeated at from four to six hours intervals, throughout the first five days. No vomiting occurred during operation, nor until six days afterward, when nausea was caused by the odor of peptonoids.

An incision was made at the site selected by Fenger, that is, parallel with, and one inch from the left costal border. The centre of my incision was on a level with the anterior extremity of the ninth rib. The tissues down to the peritoneum were rapidly cut through, and hæmostatic forceps applied to the few bleeding points, when the peritoneum itself was incised the full length of the wound. Two fingers were then entered and carried along the under surface of the liver, left lobe, as suggested by Segond, to the spine, where the stomach was found, and after several efforts, brought forward into the upper end of the abdominal opening. Upon repeated trials, a point was selected, which could be fastened to the abdominal wall with least tension on the organ. I then passed two long hare-lip pins parallel with each other, half an inch apart, and transverse to the abdominal wound. They transfixed the peritoneal and muscular tunics, but did not enter the cavity of the viscus: their ends rested on the integument, and thus they held the stomach nicely in the upper angle of the incision. Possibly I should have been content with this simple apposition of the peritoneal surfaces, as has been practiced by Macnamara, but not knowing how soon the opening into the stomach might be called for, I determined to suture that organ in position, and proceeded to do so after the manner suggested by Greig Smith, and which I will briefly describe.

A straight, flat needle, armed with plaited silk, and devoid of cutting edge, one inch and a quarter in length, was passed beneath the serous and muscular coats of the stomach, and made to encircle a space of 1$^1/_2$ inches in diameter, inclosing the pins already placed. As this needle was passed, it was brought out and re-entered, at intervals of $^3/_4$ of an inch, each time leaving a loop of thread protruding. The circuit having been completed, five loops and a tie presented; by means of a large, rounded needle, armed with double thread, these loops were successively brought directly through the abdominal wall at proper points. A rubber tube was then passed through each of the loops, which were, one by one, tightened, and lastly the tie was brought out and made around the tube. Thus the stomach was riveted, as it were, closely, and by elastic force, to the abdomen; leaving exposed an area about the size of a silver quarter. By the use of a rounded needle, there was no bleeding from the peritoneal punctures, and no blood entered the peritoneal cavity during the operation. The lower end of the incision was then closed, the peritoneum being first sewn with interrupted suture, then drainage tube placed, and lastly, silkworm gut sutures closed the muscular and cutaneous layers. Dressings were applied, and the patient put to bed. No evidences of shock were manifested. Pulse never reached 100. Temperature rose slightly on the second day, but fell to normal on the fifth day; never went above 101°. Nourishment was kept up by the stomach and bowel, almost from the close of the operation. On the fourth day the pins were removed; on the eighth day the looped sutures were taken out, and rubber tubes removed; on the tenth day, chloroform was administered, and an opening large enough to admit $^1/_4$ inch drainage tube, was made into the stomach. Three days later, all the sutures were removed, and on the fourteenth day he was sitting up. On the twenty-sixth day he went home, having been detained several days, while a silver tube with shield was being made.

He left me in good spirits, and able to take a good quantity of milk and rice by the mouth, which was supplemented by feeding through the artificial mouth.

Six months after the operation the patient's general health and strength is perfect. The gastric opening is quite small, and is kept closed by means of a silver tube, which he keeps plugged. He takes nourishment through the natural channel in small quantities, and by care and patience in masticating, succeeds, but with difficulty in getting it down into the stomach. The stricture is about as when he left me five months ago.

Reviewing briefly the subject of Gastrostomy, we learn that the first proposition for this procedure comes from a Norwegian, Egebert, by name, as early as 1837. Sedillot first practiced it of his own accord, two years later, performing three operations, the last, probably, in 1853, all three patients dying within a fortnight.

During the succeeding 20 years, various operators failed to save a patient, and so unfavorable were the results ot the few cases then reported that in 1864 the great mind of Gross heartily condemned the operation in malignant disease, and could only admit a possible good in non-malignant contractions of the œsophagus.

Erichsen, almost as late as 1873 barely concedes it a justifiable procedure in cicatricial strictures. One year later, 1874, Sydney Jones, after two unsuccessful operations, scores the first success, as published in 1876.

Agnew is most disparaging in his remarks on this subject as late as 1878.

Statistics on this operation, as given four years ago, by S. W. Gross, showed a mortality of 29.47% in a total of 207 mixed cases. The same report gave a mortality of 29.34% in 167 operations for cancerous stricture, against 29.72% in 37 cases of cicatricial stricture of œsophagus. Such figures are rather puzzling, and at the same time suggestive that the cases of cicatricial stricture fell to the hands of novices in surgery, while the malignant cases, with a presupposed unavoidable heavy mortality, fell to the hands of experienced operators, and thus the figures nearly balanced. Gross' figures still further surprise us with the show of the heavier death rate from septicæmia, peritonitis and accidents, when the operation was for cicatricial stricture. The death rate was about equal from shock in the two classes of cases; but as was naturally to be expected, the mortality from exhaustion and starvation, was higher in malignant strictures. On the whole, the death rate at the end of the first month, was 70% in malignant, against 54% in non-malignant cases. This 70% is quite a bad showing, especially when it is remembered that prolongation of life was all that could be hoped for. Few will argue that so grave an operation should be advised for a month's lease of life, which at best, would be under the worst of circumstances. It is true, the operation itself is the same, whether demanded by malignant or non-malignant cause, but the lowered vitality in later stages of malignancy should come in as a factor in the death rate. Indeed, while the operation is practically so young, it is difficult to draw any just conclusions about its mortality. A death rate based on the first few hundred operations performed helter skelter by experienced and inexperienced hands, has, in the past, done much to retard the onward progress of many important and life-saving steps in surgery —the operation often suffered while the fault was with the operator; such was doubtless true of gastrostomy. But at the present writing, so often repeated have been the successes reported, in both malignant and non-malignant cases, that the tide of surgical sentiment has changed, and the operation has a recognized reputable standing among major operations.

The object and aim of the procedure is, in all instances, the prevention of starvation, but writers recognize two classes of cases.

First, Those, where by reason of the malignancy of the very cause demanding the step, life can, at best, only hope to be prolonged for a very brief space—the wolf only driven from the door, while the jackal within devours the household.

Second, Cases in which starvation is the sole threatening to life.

In this first class of cases, especially when rectal feeding fails to support, and the pangs of hunger cannot be appeased, I consider it inhuman to withhold the chances of even temporary relief from these sufferers, and it were well not to postpone the step too long. In the latter class the outlook is most cheering, and with the improved aseptic practices and steadily increasing familiarity with abdominal surgery, the prediction has been ventured that at an early date the mortality will compare favorably with that of oophorectomy.

The operation itself needs next to be considered, and may be described as consisting of three periods : First, the opening of the abdominal cavity; second, finding and fixing the stomach in the opening; third, the opening into the stomach. Of the several lines of incision proposed and practiced by various operators, to my mind, the choice lies between the vertical incision through the rectus, near the outer border of that muscle, as practiced by Howse; and that of Fenger, which was followed in my case, reported above. The incision of Howse will perhaps be awarded the first place, when the stomach can be distended preparatory to the operation, so that the viscus bulges well into the floor of the wound, and all that needs be done is fixing it there. Another great advantage of Howse's line, is, that the contracting fibres of the rectus form more or less of a sphincter to the fistula—quite a desideratum for the patient's after comfort; but as in my case, where dilatation of the stomach was not practical, and that organ had to be searched for, Fenger's incision perhaps answered a better purpose for manipulation. It is true, we can get along with a short incision when the organ is distended, but I do not think the extent of the incision within reasonable limits, influences the death rate in any abdominal section—plenty of room for the untrammelled performance of the operation is desirable.

The advantage of having a dilated stomach is deprecated by Smith, claiming the worst can be known in regard to tension, only, when the organ is empty.

In considering the various methods of fixing the stomach in the incision, we are confronted with the question : When will you open the stomach ; at once, or will you wait for peritoneal adhesions? Circumstances should govern us in each case. In this age of surgical advancement, instances should be rare where starvation has reached such a point that the rectum cannot be relied upon to support the patient for 24 hours. Whenever practicable, the delay of the final step until union has taken place between the stomach and margins of the abdominal opening, is, on the whole, a safe course. On the other hand, some operators prefer immediate completion of the operation. Whether such a rule will be universally adopted, experience only will tell.

When delay is advisable, the plan of transfixing the two outer coats with hare-lip pins, is surely the simplest, and the experience of Macnamara tells us, is all sufficient, but the temptation to render all doubly secure, is very great, and few seem able to resist putting in a few stitches—"They often err in doing too much."

If an immediate gastric opening is demanded, the stomach is first carefully stitched to the abdominal opening, preparatory to the final step, which under such circumstances is exceedingly simple; an incision through its outer and middle coats is made, then the inner coat perforated with a small pair of forceps, by means of which a tube is entered and liquid food injected. When several days have elapsed the entire field is covered by layers of lymph, and some care is requisite not to cut too deeply. In the contracted state of the organ transfixion of both walls might easily occur; hence, I incised layer by layer, until the muscular coat was recognized and cut through, then used the forceps. In either instance a large opening is what must be guarded against. Gerster says one of his cases died of starvation, due to escape of gastric contents.

REPORT OF SIXTEEN CASES OF LAPAROTOMY.[1]

By H. C. DALTON, M. D.,

OF ST. LOUIS,

SUPERINTENDENT OF THE CITY HOSPITAL.

THE following is a report of the cases of laparotomy done by me in the St. Louis City Hospital, during the past two years :

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[1] Read before the Mississippi Valley Medical Society at St. Louis, Mo., September 26, 1888.